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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,185	07/29/2003	Yezdi Dordi	AMAT/2622.D1/CMP/ECP/RKK	9224

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EXAMINER

WONG, EDNA

ART UNIT PAPER NUMBER

1753

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,185

Applicant(s)

DORDI ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 46,48-52 and 60-65 is/are pending in the application.
4a) Of the above claim(s) 60-65 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 46 and 48-52 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This is in response to the Amendment dated January 9, 2006. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Amendment

Election/Restrictions

Claims **60-65** have been withdrawn from consideration as being directed to a non-elected invention.

Applicants state that claims 60-65 are directed to a method of plating, which may include electroplating, electroless plating and other plating methods. Claim 60 requires no material element additional to those required by claim 46 and claim 46 require all the limitations of claim 60. Thus, the method set forth in claim 60 is related to the method set forth in claim 46 as genus and species.

In response, the original invention was directed to a method for electroplating a metal because a plating bias or an electrical contact was made between an anode and a cathode.

Claim 60 is not an electroplating method of the original invention because:

(a) there is no electroplating step in the body of the claim.

The body of the claim does not even recite any plating of the metal onto the substrate. The positioning, flowing and capturing steps recited in the claim do not plate the metal onto the substrate. Thus, the method claimed is not even a

plating method;

(b) the claim is open to electroless plating, sputtering and other plating methods which Applicants' specification does not have support for; and

(c) the original invention claimed was the electroplating specie, the genus of plating was not an originally claimed invention.

Claim Objections

Claims **47 and 48** have been objected to because of minor informalities.

The objection of claims 47 and 48 has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 112

I. Claims **46-52** have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 46-52 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

II. Claims **46-52** have been rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps.

The rejection of claims 46-52 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

I. Claims **46-47 and 49-52** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Ting et al.** (US Patent No. 6,017,437) in combination with **Griego** (US Patent No. 5,879,520).

The rejection of claims 46-47 and 49-52 under 35 U.S.C. 103(a) as being unpatentable over Ting et al. in combination with Griego has been withdrawn in view of Applicants' amendment.

II. Claim **48** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **Ting et al.** (US Patent No. 6,017,437) in combination with **Griego** (US Patent No. 5,879,520) as applied to claims 46-47 and 49-52 above, and further in view of **Wang et al.** (US Patent No. 6,391,166 B1).

The rejection of claim 48 under 35 U.S.C. 103(a) as being unpatentable over Ting et al. in combination with Griego as applied to claims 46-47 and 49-52 above, and further in view of Wang et al. has been withdrawn in view of Applicants' amendment.

Response to Amendment

Election/Restrictions

This application contains claims 60-65 drawn to an invention nonelected with traverse in Paper dated January 9, 2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

Claims **46 and 48-52** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 46

line 9, it appears that the “electroplating” is the same as that recited in claim 46, line 7. However, it is unclear if it is.

Claim Rejections - 35 USC § 103

I. Claims **46 and 49-52** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ting et al.** (US Patent No. 6,017,437) in combination with **Reid** (US Patent No. 6,099,702).

Ting teaches a method for electroplating a metal onto a substrate **35** plating surface, comprising:

- (a) positioning the substrate plating surface face-up on a support member **13**
(col. 5, lines 14-17; and Fig. 5);
- (b) positioning the support member at a first vertical position in a processing cell
(Fig. 5);
- (c) flowing an electroplating solution **38** onto the substrate plating surface while
rotating **17** the substrate plating surface at the first vertical position (= raised position)
[col. 5, line 55 to col. 6, line 4; col. 6, lines 59-62; and Figs. 5 and 7];
- (d) electroplating the metal on the substrate plating surface by applying a plating
bias to the substrate (col. 11, lines 31-35);
- (e) capturing the electroplating solution used in the electroplating process with a
first peripheral catch cup **11** (= casing) positioned about a perimeter of the substrate
support member receiving member **23** (col. 10, line 65 to col. 11, line 4; and Fig. 5);
- (f) positioning the support member at a second vertical position (= lowered
position) in the cell, the second position being different from the first position (Fig. 6);
and
- (g) rinsing the substrate plating surface by flowing a rinsing agent to the
substrate while rotating the substrate at the second vertical position (col. 11, line 57 to
col. 12, line 6).

The method further comprises rotating the substrate during the flowing of the
electroplating solution (col. 9, lines 46-49) and the rinsing the substrate plating substrate
(col. 11, line 57 to col. 12, line 6).

The plating bias (= electrical power) [col. 11, lines 30-34] is applied between the substrate plating surface and an anode positioned above the substrate plating surface (Fig. 5).

The method further comprises spin-drying the substrate (= the wafer **35** is usually spinning at a relatively high rpm to enhance rinsing and drying of the wafer **35**) [col. 11, line 66 to col. 12, line 6].

The method of Ting differs from the instant invention because Ting does not disclose the following:

a. Capturing the rinsing agent with a second peripheral catch cup about a perimeter of the substrate support member, as recited in claim 46.

Ting teaches that it is appreciated that the delivery and removal of chemicals and fluids to/from a processing chamber are known in the art. Thus, the housing **49** is but one example of how the chamber **10** can be configured (col. 10, line 65 to col. 11, line 4).

Like Ting, Reid teaches a method for electroplating a metal onto a substrate using a rotatable wafer holder and rinsing means. Reid teaches a reclaim inlet **131** may circumscribe the inner plating bath containing **110** about the z-axis. A second inlet **141** is also provided circumscribed around the inner plating bath container **110** about the z-axis (col. 2, line 66 to col. 3, line 3). The second inlet **141** captures a rinsing agent (col. 3, lines 42-55; and Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by described by Ting by capturing the rinsing agent with a second peripheral catch cup about a perimeter of the substrate support member because this would have reduced the time lag between the plating and rinsing stages. Therefore, unwanted chemical reactions (e.g., corrosion and galvanic reactions) are prevented and a good surface finish is achieved as taught by Reid (col. 2, lines 11-21 and lines 30-37; and Fig. 1).

b. Providing a peripheral seal between the substrate support member and a back side of the substrate, as recited in claim 49.

Ting teaches disposing a seal between the wafer end of the electrode **15** and the interior wall of the sleeve. The seal **42** is positioned adjacent to the interior wall of the sleeve **12** so that it can effectively inhibit the electrolyte from reaching the electrode **15** when power is to be applied to the electrode (col. 8, lines 17-25; and Fig. 9).

Furthermore, if flow gaps **43** are located at the bottom of the sleeve-wafer interface, then individual seals, preferably U-shaped, are required at each of the electrode contact locations because of the gaps (col. 8, lines 44-50).

As shown in Fig. 9, the peripheral seal **42** would have also inhibited the electrolyte from reaching the back side of the substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by Ting by providing a

peripheral seal between the substrate support member and a back side of the substrate because depending upon the design and/or configuration of the processing cell, the peripheral seal would have been placed to isolate the electrolyte from reaching the undesired areas (Ting, col. 13, lines 1-12).

c. Purifying the rinsing agent captured by the second peripheral catch cup, as recited in claim 50.

Ting teaches that the drain **23** is coupled to a container for containing the electrolyte or to a waste treatment component of the system. The delivery and removal of such chemicals and fluids to/from a processing chamber are known in the art (col. 10, line 65 to col. 11, line 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by Ting by purifying the rinsing agent captured by the second fluid receiving member because one having ordinary skill in the art would have had the knowledge and skill to recycle and/or reused the rinsing agent. It has been held that changing ecological and economic considerations do not make an obvious expedient into an unobvious improvement. *Ex parte Fuller* 172 USPQ 317.

II. Claim **48** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Ting et al.** (US Patent No. 6,017,437) in combination with **Reid** (US Patent No. 6,099,702) as

applied to claims 46 and 49-52 above, and further in view of **Wang et al.** (US Patent No. 6,391,166 B1).

Ting and Reid are as applied above and incorporated herein.

The method of Ting and Reid differs from the instant invention because they do not disclose vibrating the substrate during the flowing of the electroplating solution.

Ting teaches rotating or oscillating the wafer (col. 6, line 1-4).

Like Ting, Wang teaches electroplating a metal onto a substrate plating surface. Wang teaches that in order to plate a better uniformity of film, the wafer is rotated and oscillated (col. 18, lines 38-52; col. 20, lines 14-21; and Fig. 3B).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by Ting by vibrating the substrate during the flowing of the electroplating solution because rotating and oscillating the wafer would have plated a better uniformity of film as taught by Wang (col. 18, lines 38-52; col. 20, lines 14-21; and Fig. 3B).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

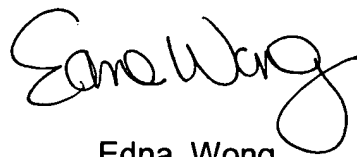
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read "Edna Wong". The signature is fluid and cursive, with the first name "Edna" and last name "Wong" clearly distinguishable.

Edna Wong
Primary Examiner
Art Unit 1753

EW
February 11, 2006